

Aug 20 02 04:27p

Nvozymes North America

(212)840-0221

p.5

21/E

CP
9/6/02

PATENT

Attorney Docket No.: 5600.200-US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Sandal et al

Confirmation No: 1759

Serial No.: 09/426,340

Group Art Unit: 1655

Filed: October 25, 1999

Examiner: Johannsen, D.

For: Method For Generating A Gene Library

AMENDMENT UNDER 37 C.F.R. 1.111

BOX AF
Commissioner for Patents
Washington, DC 20231

Sir:

In response to the Office Action mailed February 26, 2002, please amend the above-identified application as follows (a marked up version pursuant to 37 C.F.R. 1.21 is attached hereto):

IN THE CLAIMS:

Please substitute the following amended claims for the pending claims having the same claim numbers:

E1

1. (Three-times Amended) A method for generating a gene library from an environmental pool of organisms isolated from soil, animal dung, insect dung, insect gut, animal stomach, sea or lake water, waste water, sludge, or sediment, which gene library is enriched in DNA encoding a polypeptide with an activity of interest, which method comprises:

a) subjecting the environmental pool of organisms to cultivation under conditions wherein the pool of organisms is enriched in organisms harbouring said DNA, wherein said enriched pool of organisms is prepared without screening the organisms for presence of the activity of interest; and

b) preparing a gene library from the enriched environmental pool of organisms without screening the organisms for presence of the activity of interest.

E2

21. (Three-times Amended) A method of identifying a DNA sequence encoding a polypeptide of interest from an environmental pool of organisms isolated from soil, animal dung, insect dung,

Aug 20 02 04:27P

Myozymes North America

(212) 840-0221

p. 6

EZ
insect gut, animal stomach, sea or lake water, waste water, sludge, or sediment, which method comprises:

- a) subjecting the environmental pool of organisms to cultivation under conditions wherein the pool of organisms is enriched in organisms harbouring said DNA, wherein said enriched pool of organisms is prepared without screening the organisms for presence of the activity of interest;
- b) producing gene libraries from the enriched environmental pool of organisms without screening the organisms for presence of the activity of interest; and
- c) screening the libraries of step b) to identify a DNA encoding the polypeptide of interest.

REMARKS

Claims 1-19, 21-25 and 27 are pending. Claims 1 and 21 have been amended. In particular, claims 1 and 21 have been amended to delete the term "directly" and to include in the recitations of step a) and step b) that the enriched pool of organisms and the gene library, respectively, are produced "without screening the organisms for presence of the activity of interest." Support for this amendment is found throughout the specification and claims as originally filed, including, for example, at page 4, lines 4-12 and Example 1-3. Claim 21 has also been amended to specify that the claimed method is a "method for identifying" a DNA sequence encoding a polypeptide of interest. Support for this amendment is also found throughout the specification and claims as originally filed, including, for example, at page 8, line 28 to page 9, line 6 and Example 5.

It is respectfully submitted that the present amendment presents no new issues or new matter and places this case in condition for allowance. Reconsideration of the application in view of the above amendments and the following remarks is requested.

I. The Rejection of Claims 1-19, 21-25 and 27 under 35 U.S.C. 112

Claims 1-19, 21-25 and 27 are rejected under 35 U.S.C. 112 as allegedly indefinite. The Examiner alleges that the term "directly" is indefinite.

The term "directly" has been deleted from the claims, and the claims have been redrafted to clarify the meaning of this term by reciting that the gene libraries are produced from the enriched environmental pool of organisms "without screening the organisms for presence of the activity of interest."

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 112. Applicants respectfully request reconsideration and withdrawal of the rejection.

II. The Rejection of Claims 21-24 under 35 U.S.C. 112

Claims 21-24 are rejected under 35 U.S.C. 112 as allegedly indefinite. The Examiner contends that the phrase "method of selecting a DNA sequence encoding a polypeptide of interest" fails to recite a final process step that clearly relates back to the preamble of claim 21.

Claim 21 has been amended to change the recitation of the preamble from a "method of selecting" to a "method of identifying" and step c) has been amended to more clearly relate back to the preamble by specifying that step involves "screening the libraries of step b) to identify a DNA encoding the polypeptide of interest."

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 112. Applicants respectfully request reconsideration and withdrawal of the rejection.

III. The Rejection of Claims 1-7, 13-19, 21-25 and 27 under 35 U.S.C. 103

Claims 1-7, 13-19, 21-25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duvick et al. in view of Sarkar and Upadhyay. This rejection is respectfully traversed.

The present invention is directed to a process for generating a gene library from an environmental pool of organisms, in which the gene library is enriched in DNA encoding a polypeptide with an activity of interest. In accordance with the present invention, a gene library enriched in DNA encoding a polypeptide with an activity interest is prepared by a) subjecting the environmental pool of organisms to cultivation under conditions wherein the pool of organisms is enriched in organisms harbouring DNA encoding a polypeptide with an activity or interest; and b) preparing a gene library from the enriched environmental pool of organisms. An advantage of the present invention is that the gene library can be prepared without the need to first carryout strain selection and screening (i.e., phenotype checks) to identify or purify suitable DNA sources for use in creating the gene library. As amended, the claims further clarify this aspect of the present invention by reciting that the process entails preparing a gene library from the enriched environmental pool of organisms wherein both the enriched pool of organisms and the gene library are prepared "without screening the organisms for presence of the activity of interest."

Duvick et al. is entirely remove from the claimed invention as Duvick et al. discloses a process which requires strain selection and screening to identify organisms possessing the activity of interest before the gene library is prepared. In the Office Action, the Examiner asserts that Duvick et al. does not require a screening process between the enrichment the creation of the library. However, this assertion is not supported by the teachings of Duvick et al. Indeed, in Duvick et al., a genomic library from microorganism is prepared only after first selecting and screening a sample for microorganism demonstrating fumonisin-resistance. After screening the sample to identify the activity of interest, the microorganisms demonstrating fumonisin-resistance are then used to create a genomic library. See Duvick et al. at page 24, lines 19-20 ("Microorganisms demonstrating fumonisin-resistance can be used to create a genomic library using standard techniques, well known in the art."). Thus, Duvick et al. plainly does not disclose or even suggest a method of preparing a gene library from an enriched

environmental pool of organisms without the step of screening the organism for presence of the activity of interest.

The secondary reference does not cure the defects of Duvick et al. The Examiner contends that "Sarkar and Upadhyay disclose that *Bacillus thermoalcaliphilus* "isolated from the...soil of a termite..." As the above analysis points out, the instant invention does not either go through the preliminary screening process taught by Duvick et al. or start through the isolation of a specific organism.

During the interview, the Examiner informed Applicant's representative that step a) must also be amended to further distinguish Duvick et al. Accordingly, step a) has been amended to more clearly differ from Duvick et al. by also reciting that the enriched environmental pool of organisms is prepared "without screening the organisms for presence of the activity of interest."

Accordingly, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

IV. The Rejection of Claims 1-9, 13-19, 21-25 and 27 under 35 U.S.C. 103

Claims 1-9, 13-19, 21-25 and 27 are rejected under 35 U.S.C. 103 as being unpatentable over Duvick et al. in view of Cotta. This rejection is respectfully traversed.

The above remarks are fully applicable to this rejection and are herein specifically incorporated by reference. The addition of Cotta fails to cure the defects of Duvick et al. Knowledge that there are several bacteria in the presence of the rumen of cattle does not teach or suggest to an artisan a process for preparing a gene library from the enriched environmental pool of organisms without first screening the organisms for presence of the activity of interest.

Accordingly, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

V. The Rejection of Claims 1-8, 10, 12-19, 21-25 and 27 under 35 U.S.C. 103

Claims 1-8, 10, 12-19, 21-25 and 37 are rejected under 35 U.S.C. 103 as being unpatentable over in view of Jacobsen and Schlein. This rejection is respectfully traversed.

The above remarks are fully applicable to this rejection and are herein specifically incorporated by reference. The addition of Jacobsen et al. fails to cure the defects of Duvick et al. Knowledge that "*Leishmania* present in the midgut of the sandfly *phlebotomus papatasi* produce cellulases" does not teach or suggest to an artisan a process for preparing a gene

library from the enriched environmental pool of organisms without first screening the organisms for presence of the activity of interest.

Accordingly, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

VI. The Rejection of Claim 11 under 35 U.S.C. 103

Claim 11 is rejected as obvious over Duvick et al. in view of Jacobsen and Schlein, and further in view of Siegle et al. This rejection is respectfully traversed.

The above remarks are fully applicable to this rejection and are herein specifically incorporated by reference. The addition of Jacobsen et al. and Siegle et al. fails to cure the defects of Duvick et al. Knowledge that "Leishmania present in the midgut of the sandfly *phlebotomus papatasi* produce cellulases" of Jacobsen et al. combined with "a variety of orders and species of arthropods" of Siegle et al. does not teach or suggest to an artisan a process for preparing a gene library from the enriched environmental pool of organisms without first screening the organisms for presence of the activity of interest.

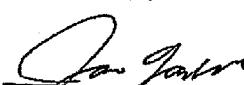
Accordingly, Applicants submit that claim 11 overcomes this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

VII. Conclusion

In view of the above, it is respectfully submitted that all claims are in condition for allowance. Early action to that end is respectfully requested. The Examiner is hereby invited to contact the undersigned by telephone if there are any questions concerning this amendment or application.

Respectfully submitted,

Date: August 20, 2002



Jason I. Garbell, Reg. No. 44,116
Novozymes North America, Inc.
500 Fifth Avenue, Suite 1600
New York, NY 10110
(212) 840-0097